

**PATENT APPLICATION**

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**TRICKLE WATERFALL FOR SPA**

**Richard Kunkel**

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BACKGROUND OF THE INVENTION

1. Field of the Invention.

[0001]

The present invention relates generally to improvements in portable spas, and more particularly, pertains to new and improved water features for a portable spa wherein a waterfall is provided as part of the portable spa for the enjoyment and entertainment of the spa users.

2. Description of Related Art.

[0002]

In the field of portable spas, manufacturers are continually trying to enhance the portable spa product by adding various entertainment features to it beyond the hot water and jet massaging functions. Manufacturers have added audio systems to a portable spa device. Some manufacturers have added water features, such as waterfalls, to portable spa devices. The problem associated with the inclusion of a waterfall in a portable spa is the amount of space required by the waterfall. The present invention overcomes this problem.

SUMMARY OF THE INVENTION

[0003]

A channel with a closed end and an open end is set into the top rim of a portable spa with the open end of the channel located at the edge of the top rim

on the inside wall. Water is fed into the channel at the closed end so that it flows over a light source, picking up light energy. The water flows in laminar fashion along the channel embedded in the top rim guided by flow ribs located along the channel floor. A disruptor button on the channel floor at the open end disturbs the laminar flow, causing the light in the water flow to be reflected and become more visible as it falls into the main water body in the spa.

#### BRIEF DESCRIPTION OF THE DRAWINGS

[0004]

The objects and advantages of the present invention will become readily apparent upon consideration of the following detailed description in conjunction with the accompanying drawings in which like reference numerals designate like parts throughout the figures thereof and wherein:

[0005]

Figure 1 is a perspective illustration of a preferred embodiment of the present invention.

[0006]

Figure 2 is an assembly drawing of the waterfall of Figure 1.

[0007]

Figure 3 is a top perspective of the channel of the waterfall of Figure 1.

[0008]

Figure 4 is a top plan view of the channel of Figure 3.

[0009]

Figure 5 is a cross-section taken along line 5-5 of Figure 4 looking in the direction of the arrows.

[0010]

Figure 6 is a top and bottom perspective of a top cap for the waterfall of Figure 1.

[0011]

Figure 7 is a perspective of the lens used in the channel of the waterfall of Figure 1.

[0012]

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0013]

The waterfall feature 11 of the present invention, as seen in Figure 1, is located in the top rim 13 of the portable spa with the water flow channel 15 embedded in the top rim 13 of the spa. Water 19 falls from the channel 15 at the inside edge of the spa rim into the main water body 17 of the spa with a splash 21, causing light reflection from the flow and the splash, if the water flow 19 is lighted in a manner hereinafter described.

[0014]

Figure 2 illustrates the basic parts of a preferred embodiment of the present invention. The channel 15 of the waterfall is shown as having an open

end 39 and a closed end 47 with walls 41 defining a channel of flow for water entering channel 15 at an access aperture 33 in a platform 31 at the closed end 47 of channel 15. Aperture 33 connects to a threaded coupling 25 on which a pipe coupling nut 27 may be threaded to connect the aperture 33 to the water circulation system of the portable spa.

[0015]

The bottom 34 of channel 15 has a plurality of ribs 35 extending from the closed end 47 to the open end 39. The water flow entering at aperture 33 at the closed end 47 flows towards the open end 39 in a quiet laminar manner because of the ribs 35. A disruptor button 37 located at the open end 39 of channel 15 disturbs the water flow at the open end 39 just before the water spills over lip 43 of channel 15 into the main body of water of the portable spa (not shown). The disruptor button 37 creates enough turbulence in the water flow at that point to cause the light energy in the water to be reflected out of the water flow and thereby become more visible to the human eye.

[0016]

A cap 23 of unique construction, as will be explained hereinafter, with a skirt 49 around its back side snaps onto studs 55 over aperture 33 on the platform 31, thereby forming an inlet chamber having a directional opening that directs the water flow towards the open end 39 of channel 15. An aperture 30 located in the platform 31 and bottom 34 of channel 15 is closed by a lens ramp 29 constructed in a manner as will be described hereinafter. The lens 29 is

located at the flow output of the inlet chamber so that the flow is over the lens and light from the other side of the lens is injected into the water flow, as it leaves the inlet chamber. The light source (not shown) may be of any convenient structure. The use of CFD's of various colors, however, is particularly suited for this application.

[0017]

Figure 3 illustrates more clearly the channel wall structure 40 and 41 and floor 34 of the channel 15 that guides the water between the closed end 47 and the open end 39. It should be remembered that this entire structure is located in the top rim of a portable spa. The upper walls are preferably flush with the top rim. The platform 31 at the closed end 47 of the channel is raised above the floor 34 of the channel 15 so as to create a drop in height between the platform 31 and the floor 34. An aperture 30 is located between the platform level 31 and floor 34 in the flow path. The aperture is filled by a lens ramp 29 of a construction as will hereinafter be described. The water that comes in the chamber at aperture 33 in platform 31 gets accelerated slightly when it flows down the incline formed by the lens ramp 29 in aperture 30. Besides accelerating slightly, the water flow picks up light energy passing through the lens from the other side.

[0018]

As can be seen in Figure 4, the shape of the channel 15 is unique in that the wall 41 at the inside water edge of the top rim is thicker and straight, while the wall 39 at the outside edge of the top rim is curved. This shape provides a

very aesthetically pleasing water flow channel that fits within the confines of the top rim of the portable spa.

[0019]

As can be seen in Figure 5, the threaded stud 25 empties directly into the aperture 33 in platform 31. Located in aperture 33 is a plurality of water flow guides 36 which tend to quiet the turbulent flow entering attachment stud 25 into more laminar flow that exits aperture 33 and fills the chamber above platform 31 before flowing down lens ramp 29, picking up light energy on its way.

[0020]

Figure 6 illustrates in greater detail the cap 23 which fits over the aperture 33 in the raised platform 31 at the closed end of flow channel 15. Cap 23 has a skirt 49 that extends around the perimeter, except for a short distance of the perimeter, which allows water to flow out of the chamber. The skirt 49 has a pair of columns with apertures 51 and 53 therein, respectively, that fit into studs 57 and 55 (Figure 3). The skirt 47 of the cap 23 is glued to the platform 31, thereby creating a chamber which has only one egress for the water entering at aperture 33 in platform 31.

[0021]

The lens ramp 29 which fits into aperture 30 of the water flow channel is built to have a ledge 65 at its concave back side, a ledge 61 at its convex front side, and ledges 67 between the front and back sides, so that the ramp easily

snaps into the aperture and is glued by way of these ledges to the material surrounding aperture 30 in channel 15. The lens ramp 29 has a flat portion 63 at the top which conforms with platform 31, thereby providing a smooth flow path for the water from the channels into the flow channel 18.